

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 13 MAR 2006

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Applicant's or agent's file reference REP07660WO	FOR FURTHER ACTION		See Form PCT/PEA/416
International application No. PCT/GB2005/000121	International filing date (day/month/year) 14.01.2005	Priority date (day/month/year) 14.01.2004	
International Patent Classification (IPC) or national classification and IPC INV. B41M5/26 C09D11/00 C09D11/02			
Applicant SHERWOOD TECHNOLOGY LTD. et al.			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of 5 sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau) a total of 1 sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input checked="" type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).			
4. This report contains indications relating to the following items: <div style="margin-left: 20px;"> <input checked="" type="checkbox"/> Box No. I Basis of the report <input checked="" type="checkbox"/> Box No. II Priority <input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability <input type="checkbox"/> Box No. IV Lack of unity of invention <input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement <input type="checkbox"/> Box No. VI Certain documents cited <input type="checkbox"/> Box No. VII Certain defects in the international application <input checked="" type="checkbox"/> Box No. VIII Certain observations on the international application </div>			
Date of submission of the demand 14.11.2005	Date of completion of this report 10.03.2006		
Name and mailing address of the international preliminary examining authority: <div style="display: flex; align-items: center;"> <div> European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 </div> </div>	Authorized officer Zeslawski, W Telephone No. +49 89 2399-7159		



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
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Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-22 as originally filed

Claims, Numbers

1-11 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☒ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☒ the claims, Nos. 12-23
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. II Priority

1. ☒ This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
☒ copy of the earlier application whose priority has been claimed (Rule 66.7(a)).
☐ translation of the earlier application whose priority has been claimed (Rule 66.7(b)).
2. ☐ This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rule 64.1). Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-11
Inventive step (IS)	Yes: Claims	
	No: Claims	1-11
Industrial applicability (IA)	Yes: Claims	1-11
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

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Reference is made to the following documents:

- D1: WO 2004/043704 A (SHERWOOD TECHNOLOGY LIMITED; STUBBS, BRIAN) (2004-05-27)
- D2: WO 2004/045857 A (SUN CHEMICAL CORPORATION; LUCAS, OLAF; KROTH, DAGMAR, MARIA; THAI, QUA) (2004-06-03)
- D3: WO 02/068205 A (SHERWOOD TECHNOLOGY LTD; KHAN, NAZIR) (2002-09-06)
- D4: PATENT ABSTRACTS OF JAPAN vol. 1995, no. 06, (1995-07-31) & JP 07 070548 A (ASAHI GLASS CO LTD), (1995-03-14) & WPI abstract AN: 1995-145097.
- D5: US 2003/180660 A1 (KHAN NAZIR) 25 September 2003 (2003-09-25)
- D6: US-A-4 861 620 (AZUMA ET AL) 29 August 1989 (1989-08-29)
- D7: US-B1-6 444 068 (KOOOPS ARNE ET AL) 3 September 2002 (2002-09-03)
- D8: US-B1-6 627 299 (FENG KE ET AL) 30 September 2003 (2003-09-30)
- D9: EP-A-0 697 433 (GENERAL ELECTRIC COMPANY) 21 February 1996 (1996-02-21)
- D10: EP-A-0 867 466 (JAPAN POLYCHEM CORPORATION; RHOMBIC CORPORATION) (1998-09-30)

Article 34(2)(b) PCT

The amendments filed with the letter dated 14.11.2005 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The subject matter of claim 12 and its dependent claims 13-23 have no support in the description and has not been claimed in originally filed application.

The last paragraph on page 1 gives an indication that:

- 1) a metal salt, i.e. IR-absorber/colour developer material, on absorption of radiation from a laser source (wavelength is not specified), can directly produce a colour-forming reaction, and
- 2) a metal salt, i.e. IR-absorber/colour developer material can be combined with a component, that on irradiation at higher wavelength (wavelength is not specified) undergoes the desired reaction,

but this information is insufficient to reword present claim 12, in order to comply with Article 34(2)(b) PCT.

Clarity (Art.6 PCT)

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Claim 1 does not meet the requirements of Art. 6 PCT in that the matter for which protection is sought is not defined. The claim attempts to define the subject-matter in terms of the result to be achieved, i.e. "thereby causes the marking component to change colour". Such a formulation is not allowable because it appears possible to define the subject-matter in more concrete terms, viz. in terms of how the effect is to be achieved.

Novelty (Art.33(2) PCT)

Each of the cited documents discloses a composition comprising a metal salt, which absorbs laser irradiation at 700 to 2000 nm and a marking component (D1: ex.8; D2: ex.1; D3: p.2 l.27 to p.4 l.8; D4: WPI abstract; D5: col.4 l.36-50; D6: par.[016] to [020]; D7: ex.1; D8: col.4 l.44-67 and col.9 l.13-18; D9: ex.1; D10: examples).

Therefore, the subject matter of claims 1-11 is not novel over each of the cited documents.

Inventive Step (Art.33(3) PCT)

Since the subject matter of claims 1-11 is regarded as being not novel, the discussion of the inventive step appears to be pointless.

12. An ink formulation comprising a marking component and a metal salt, wherein the marking component in the absence of the metal salt undergoes a colour change in response to laser irradiation at a wavelength above 2000 nm but not between 700-2000 nm, and the metal salt absorbs laser radiation at 700-2000 nm thereby causing the marking component to change colour.
13. A formulation according to claim 12, wherein the metal is a transition metal.
14. A formulation according to claim 13, wherein the metal is copper.
15. A formulation according to any preceding claim, wherein the salt is a poly-metal salt.
16. A formulation according to claim 12, wherein the salt is copper hydroxyl phosphate.
17. A formulation according to any of claims 12 to 16, which additionally comprises a compound including an oxymetal anion.
18. A formulation according to any of claims 12 to 17, which additionally comprises a colour-forming compound.
19. A formulation according to any of claims 12 to 18, which additionally comprises a binder.
20. A formulation according to any of claims 12 to 19, which is water-based.
21. A formulation according to any of claims 12 to 20, which comprises an organic solvent.
22. A method for forming an image on a substrate, which comprises applying onto the substrate a formulation according to any of claims 12 to 21, and irradiating it with a laser.
23. A method according to claim 22, wherein the laser is a diode or CO₂ laser.